

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation	8/2/2013 12:23:26 PM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10	Aroclor											
11												
12	General Statistics											
13	Total Number of Observations	38	Number of Distinct Observations	32								
14	Number of Detects	15	Number of Non-Detects	23								
15	Number of Distinct Detects	14	Number of Distinct Non-Detects	18								
16	Minimum Detect	4.95	Minimum Non-Detect	1.3								
17	Maximum Detect	10.93	Maximum Non-Detect	9.8								
18	Variance Detects	2.841	Percent Non-Detects	60.53%								
19	Mean Detects	7.267	SD Detects	1.686								
20	Median Detects	6.915	CV Detects	0.232								
21	Skewness Detects	0.833	Kurtosis Detects	0.189								
22	Mean of Logged Detects	1.96	SD of Logged Detects	0.223								
23												
24	Normal GOF Test on Detects Only											
25	Shapiro Wilk Test Statistic	0.93	Shapiro Wilk GOF Test									
26	5% Shapiro Wilk Critical Value	0.881	Detected Data appear Normal at 5% Significance Level									
27	Lilliefors Test Statistic	0.163	Lilliefors GOF Test									
28	5% Lilliefors Critical Value	0.229	Detected Data appear Normal at 5% Significance Level									
29	Detected Data appear Normal at 5% Significance Level											
30												
31	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
32	Mean	3.771	Standard Error of Mean	0.533								
33	SD	3.105	95% KM (BCA) UCL	4.719								
34	95% KM (t) UCL	4.67	95% KM (Percentile Bootstrap) UCL	4.596								
35	95% KM (z) UCL	4.647	95% KM Bootstrap t UCL	4.687								
36	90% KM Chebyshev UCL	5.37	95% KM Chebyshev UCL	6.095								
37	97.5% KM Chebyshev UCL	7.1	99% KM Chebyshev UCL	9.075								
38												
39	Gamma GOF Tests on Detected Observations Only											
40	A-D Test Statistic	0.322	Anderson-Darling GOF Test									
41	5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level									
42	K-S Test Statistic	0.158	Kolmogrov-Smirnoff GOF									
43	5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level									
44	Detected data appear Gamma Distributed at 5% Significance Level											
45												
46	Gamma Statistics on Detected Data Only											
47	k hat (MLE)	21.24	k star (bias corrected MLE)	17.03								
48	Theta hat (MLE)	0.342	Theta star (bias corrected MLE)	0.427								
49	nu hat (MLE)	637.1	nu star (bias corrected)	511								
50	MLE Mean (bias corrected)	7.267	MLE Sd (bias corrected)	1.761								
51												
52	Gamma Kaplan-Meier (KM) Statistics											
53	k hat (KM)	1.474	nu hat (KM)	112								
54	Approximate Chi Square Value (112.04, α)	88.6	Adjusted Chi Square Value (112.04, β)	87.74								
55	5% Gamma Approximate KM-UCL (use when $n \geq 50$)	4.768	95% Gamma Adjusted KM-UCL (use when $n < 50$)	4.815								
56												
57	Gamma ROS Statistics using Imputed Non-Detects											
58	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
59	GROS may not be used when kstar of detected data is small such as < 0.1											
60	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
61	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
62	Minimum	1.992	Mean	4.849								

	A	B	C	D	E	F	G	H	I	J	K	L
63					Maximum	10.93					Median	4.007
64					SD	2.286					CV	0.471
65					k hat (MLE)	5.205					k star (bias corrected MLE)	4.812
66					Theta hat (MLE)	0.931					Theta star (bias corrected MLE)	1.008
67					nu hat (MLE)	395.6					nu star (bias corrected)	365.7
68					MLE Mean (bias corrected)	4.849					MLE Sd (bias corrected)	2.21
69											Adjusted Level of Significance (β)	0.0434
70					Approximate Chi Square Value (365.71, α)	322.4					Adjusted Chi Square Value (365.71, β)	320.7
71					95% Gamma Approximate UCL (use when $n \geq 50$)	5.5					95% Gamma Adjusted UCL (use when $n < 50$)	5.529
72												
73	Lognormal GOF Test on Detected Observations Only											
74					Shapiro Wilk Test Statistic	0.963					Shapiro Wilk GOF Test	
75					5% Shapiro Wilk Critical Value	0.881					Detected Data appear Lognormal at 5% Significance Level	
76					Lilliefors Test Statistic	0.145					Lilliefors GOF Test	
77					5% Lilliefors Critical Value	0.229					Detected Data appear Lognormal at 5% Significance Level	
78	Detected Data appear Lognormal at 5% Significance Level											
79												
80	Lognormal ROS Statistics Using Imputed Non-Detects											
81					Mean in Original Scale	5.263					Mean in Log Scale	1.603
82					SD in Original Scale	1.966					SD in Log Scale	0.332
83					95% t UCL (assumes normality of ROS data)	5.801					95% Percentile Bootstrap UCL	5.767
84					95% BCA Bootstrap UCL	5.86					95% Bootstrap t UCL	5.905
85					95% H-UCL (Log ROS)	5.794						
86												
87	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
88					KM Mean (logged)	0.967					95% H-UCL (KM -Log)	5.128
89					KM SD (logged)	0.846					95% Critical H Value (KM-Log)	2.228
90					KM Standard Error of Mean (logged)	0.146						
91												
92	DL/2 Statistics											
93	DL/2 Normal						DL/2 Log-Transformed					
94					Mean in Original Scale	3.739					Mean in Log Scale	0.881
95					SD in Original Scale	3.193					SD in Log Scale	0.992
96					95% t UCL (Assumes normality)	4.613					95% H-Stat UCL	5.824
97	DL/2 is not a recommended method, provided for comparisons and historical reasons											
98												
99	Nonparametric Distribution Free UCL Statistics											
100	Detected Data appear Normal Distributed at 5% Significance Level											
101												
102	Suggested UCL to Use											
103					95% KM (t) UCL	4.67					95% KM (Percentile Bootstrap) UCL	4.596
104												
105	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
106	Recommendations are based upon data size, data distribution, and skewness.											
107	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
108	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
109												